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Before the
Federal Communications Commission
Washington, D.C. 20554

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY

In the Matter of)
)
Revision of the Commission's Rules)
to Ensure Compatibility with)
Enhanced 911 Emergency Calling Systems)

CC Docket No. 94-102

DOCKET FILE COPY ORIGINAL

ADDITIONAL COMMENTS OF KSI INC.

KSI Inc. ("KSI"), pursuant to Section 1.415(d) of the Commission's Rules, 47 C.F.R. § 1.415(d), hereby submits its Additional Comments in the wireless Enhanced 911 ("E911") rule making proceeding.¹ By Public Notice dated February 16, 1996, the Commission seeks comment on whether to adopt, in whole or in part, the February 13, 1996, ex parte presentation by the Cellular Telecommunications Industry Association ("CTIA"), National Emergency Number Association ("NENA"), Association of Public Safety Communications Officials ("APCO"), and National Association of State Nine One One Administrators ("NASNA") entitled "Public Safety-Wireless Industry Consensus: Wireless Compatibility Issues, CC Docket No. 94-102" ("Consensus Agreement").

The Consensus Agreement proposes a two-step implementation schedule for wireless E911 service. In Phase I, cell site information, calling party automatic number identification ("ANI"), 911 availability from any service initialized mobile radio handset, 911 access for speech and hearing-

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¹ Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems, CC Docket No. 94-102, Notice of Proposed Rule Making, 59 Fed. Reg. 54878 (1994) ("NPRM").

impaired callers using text telephone ("TTY") devices, and call-back capability would be implemented within 12 or 18 months after adoption of an Order in this Docket. In Phase II, within five years after adoption of an Order in this Docket, automatic location of wireless callers within 125 meters Root Mean Square ("RMS") must be achieved. The Consensus Agreement also requests the Commission 1) to declare that state and local 911 fees and taxes are not barred and that such fees should not discriminate between wireless and wireline carriers and 2) to resolve carrier and public safety legal liability issues.

KSI has actively participated in this proceeding since the NPRM was released on October 19, 1994, by filing Comments on January 9, 1995, and Reply Comments on March 17, 1995. KSI continues to commend the Commission for its efforts to require that E911 services be made available to mobile radio service users to enhance safety. KSI also notes the contributions made by the public safety community and the wireless industry to advance this proceeding. As such, the Consensus Agreement put forth by CTIA, NENA, APCO, and NASNA represents another important step forward in achieving an Order that will speed the provision of E911 services. KSI enthusiastically supports the Consensus Agreement consistent with the clarifying modifications set forth below and supported by the accompanying materials.

- A. The Commission Should Order that Wireless E911 Service Be Fully Operational By the End of Phase II By Mandating a 12-Month Timeframe for Phase I, Requiring Annual Progress Reports on Implementation and Refusing to Grant Any Extensions.

As the Commission is aware, location technologies exist today that are capable of meeting the accuracy standards proposed by the NPRM and the Consensus Agreement. Thus, there is no reason to delay a requirement that wireless E911 service be made available as quickly as possible.

KSI acknowledges that although the technology is capable of currently being implemented, deployment considerations necessitate a reasonable period of time before this service must be provided by commercial mobile radio service ("CMRS") providers. The Consensus Agreement reports that Public Safety Communicators ("PSCs") urge the adoption of a 12-month timeframe for Phase I governing the provision of cell site information using a seven or ten-digit pseudo-ANI and a seven or ten-digit caller ANI, depending on the local landline network's signaling capability. CTIA believes that 18 months is a realistic period.² KSI strongly supports the 12-month period urged by PSCs. As stated above, there is no reason to delay any aspect of this service given the capabilities that exist today and the enormous public safety benefits that can be achieved.

For the same reasons, KSI urges the Commission to impress on all parties to this proceeding that the five-year period for Phase II represents the maximum amount of time to implement wireless E911 service fully and completely. Because it is clear that the Commission is committed to issuing a Report and Order in this docket as quickly as possible, KSI believes that a five-year period is more than adequate for carriers to implement this service. If, however, a Report and Order is not issued promptly, KSI strongly urges the Commission to set a specific completion date for implementation such as April 1, 2001. In addition, the Commission should make it clear that there will be no extensions of Phase II and, to ensure that there is no possibility of delay beyond the five-year period, the Commission should require annual progress reports that demonstrate exactly what has been accomplished and a time table that illustrates how full implementation of wireless E911 service will be achieved on or before the expiration of Phase II.

² Consensus Agreement at 1, n.1.

B. The Commission Should Adopt a Performance Requirement that Ensures That a Phase II Location Capability Includes the Provision of Timely Locations.

As noted above, KSI supports the adoption of a date certain by which CMRS providers must be able automatically to establish the location of 911 callers and to provide that information to the appropriate public safety answering service ("PSAP"). Both the NPRM and the Consensus Agreement acknowledge that the public interest requires enhanced efficiency for 911 wireless service since no static data base can provide the needed location information to route calls to the appropriate PSAP. To achieve the required level of E911 service, information about the caller's locations must be received in a sufficiently timely manner to support prompt call routing to the appropriate PSAP and to support direction of the responses. Thus, KSI urges the Commission to mandate a specific performance requirement that addresses the maximum acceptable latency period for the provision of caller location information and respectfully suggests that the period be no longer than five seconds.

To further ensure that the public receives sufficient public safety benefits, KSI also urges the Commission to require the successive timely updating of location information within the 125 meter RMS distance criterion at ten-second intervals over the duration of the call in progress. The mobile context demands such successive updating. While the routing and placement of a mobile call may be rapid, the mobile caller may frequently move beyond the 125 meter RMS range from an initial location before the PSAP agent can answer the call. Furthermore, successive updating provides progressively improved location accuracy not only when the callers are in motion, but also when initial stationary information at call setup is degraded. Technology currently exists to provide these important public safety benefits. For example, KSI's Direction Finding Localization System

("DFLS") is capable of providing initial location information for the control channel before such information becomes available for a voice channel and ongoing location information for any voice channel. Without such a requirement, mobile callers will continue to lack adequate protection.

As KSI stated in its Comments, all CMRS providers, including providers of data messaging services for units such as two-way pagers and wireless personal digital assistants ("PDAs"), should be required to meet E911 standards.³ Providers of Intelligent Transportation Systems ("ITS") solutions for Emergency Notification and Personal Security ("ENPS"), for example, are likely to embrace data transmission implementations. KSI notes that its DFLS infrastructure does not preclude locating data messaging units. By mandating E911 requirements for all CMRS providers at the outset, the Commission can avoid future problems associated with imposing E911 on excluded providers. KSI understands, however, that if a compromise solution is not possible that includes all CMRS providers at the outset, then the Commission should not delay the imposition of E911 rules on other CMRS providers.

C. Real Field Data Collected by KSI Indicate that Accurate Location Information for Standard, Unmodified Cellular Telephones Is Currently Obtainable.

In the interest of developing support for the acceptance of wireless E911, KSI has shared its expertise in and knowledge of location information technology within the wireless community. KSI has also participated extensively with wireless service providers, equipment manufacturers, and CTIA staff in various settings such as joint expert meetings ("JEMs") and NENA, APCO and NASNA deliberations in an effort to reach a consensus on E911. KSI has brought a unique perspective to the debate as one of the few companies with the experience and expertise in design,

³ Comments of KSI Inc. at 15-16.

development and deployment of location information systems. KSI previously submitted data for control-message-derived (call setup) fixed locations and voice-communication locations for both fixed and mobile units.⁴

KSI notes that, in most cases, robust implementations of location technology have employed the type of statistical performance measures set forth in KSI's Comments⁵ and Reply Comments.⁶ KSI strongly believes that descriptions of accuracy such as those depicting the semi-major and semi-minor axes and the inclination representing the elliptical region of uncertainty at a specified probability of containment would convey the information appropriate to ensure a timely PSAP response and to facilitate better understanding by users. Alternatively, a required maximal radius of circular error probability ("Rcep") for the elliptical area equivalent at the associated containment probability is commonly used to specify the performance of location information systems. Nevertheless, KSI supports the compromise of 125 meters RMS as set forth in the NPRM and the Consensus Agreement.

In Exhibit 4 to the Consensus Agreement, CTIA has included a letter from Louis A. Stilp of the Associated Group to Bob Miller, 911 Director of the New Jersey Office of Emergency Telecommunications Systems dated January 3, 1996. KSI wishes to clarify certain misunderstandings contained in that letter regarding real field data for localization technology. KSI has collected an abundance of data using two-standard deviation uncertainty ellipse axes rather than

⁴ Comments of KSI Inc. at App. B, pp. 5-6; Reply Comments of KSI Inc., Figs. 1-5.

⁵ Comments of KSI Inc. at 20-22.

⁶ Reply Comments of KSI Inc. at 4-5.

RMS because the former provides more information.⁷ KSI has collected RMS data consistent with the criteria set forth in the Consensus Agreement, however, and has submitted it to the Commission attached to its January 30, 1996, ex parte filing. Additional RMS data is attached to these Additional Comments as Exhibit A.⁸

⁷ KSI has collected literally thousands of sets of field trial data from fixed and moving positions over broad geographic regions in two states and has routinely evaluated the accuracy of the locations obtained with the measures of performance more typically used in the localization industry.

⁸ The Stilp letter contains a further misunderstanding in that it purports that Dr. Maloney had any "disagreement" with any data or actual performance characteristic measurements for any particular system. Dr. Maloney did not state or imply he was "willing [to] back off" KSI's experience that the accuracy of localization systems can often be characterized by the statistical expectations associated with two-dimensional normal distributions. Certainly Dr. Maloney did not question the observed results that Mr. Stilp presented, but merely advised the PSCs that, when a generic system performance is characterized by unbiased, two-dimensional, normal Gaussian distributions, such a system contains 63-68 percent of the actual positions within one RMS miss-distance of the estimated positions. KSI's DFLS technology can be adequately represented by two-dimensional normal distributions, which can be associated with either Rayleigh or Rice-Nakagami distributions for the miss distances. The observed RMS values for DFLS are typically far smaller than the 125 meters set forth in the NPRM or the Consensus Agreement, and the DFLS containment percentages within a 125 meter distance are typically 100 percent.

CONCLUSION

KSI urges the Commission to adopt the NPRM consistent with the Consensus Agreement and the modifications suggested in KSI's Comments, Reply Comments and Additional Comments.

**Respectfully submitted,
KSI Inc.**

By: _____



Charles J. Hinkle, Jr.

KSI Inc.

7630 Little River Turnpike

Suite 212

Annandale, Virginia 22003

(703) 941-5749

Of Counsel:

Robert B. Kelly

W. Ashby Beal, Jr.

KELLY & POVICH, P.C.

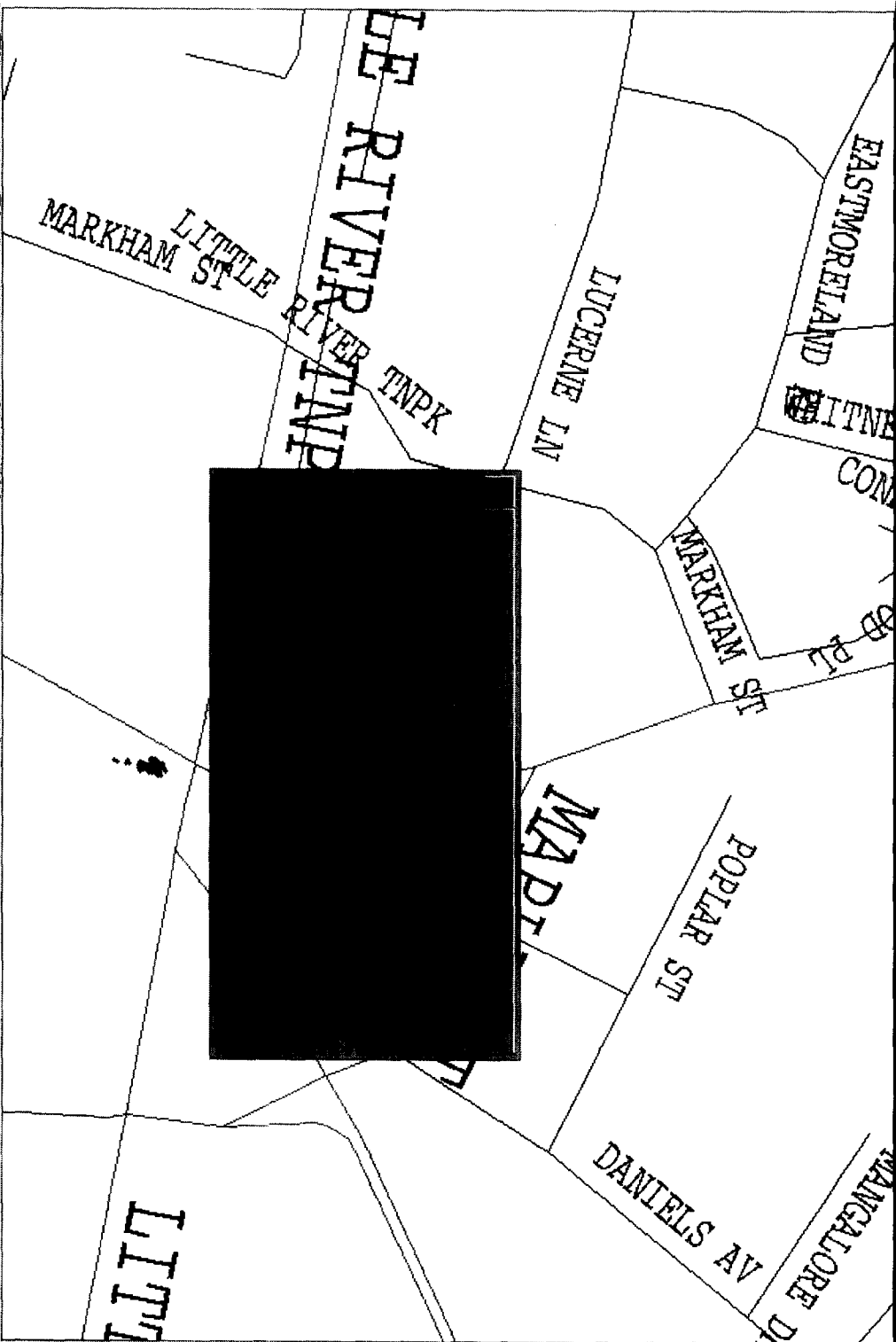
Suite 300

1101 30th Street, N.W.

Washington, D.C. 20007

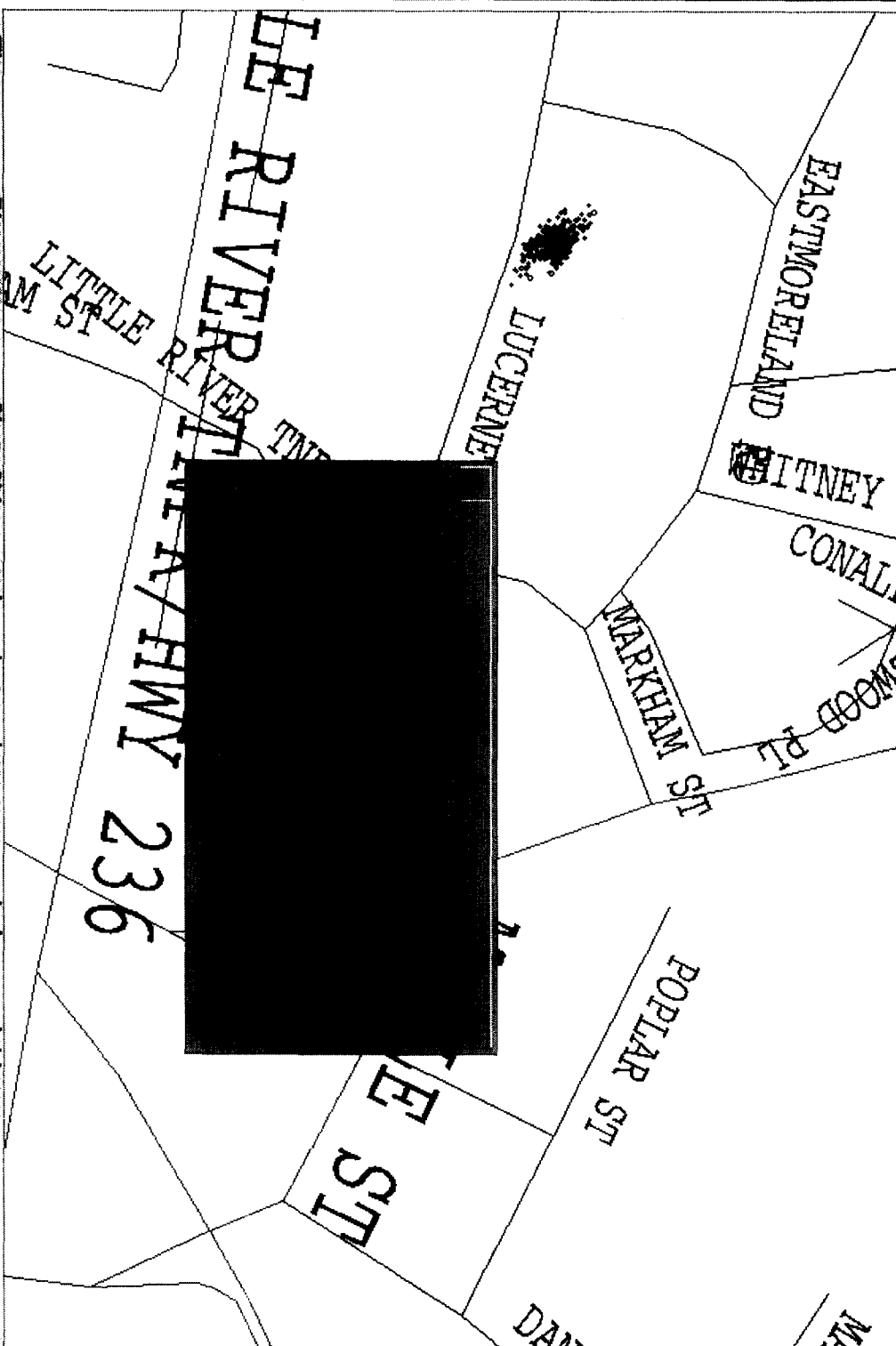
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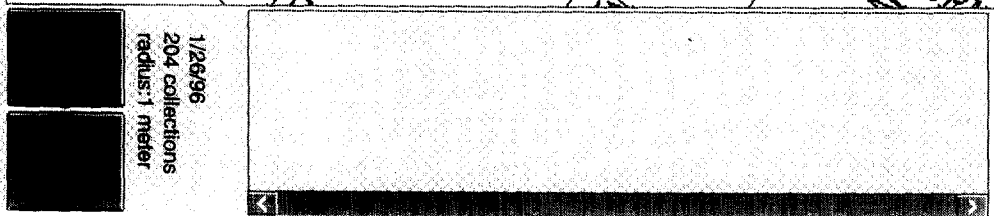
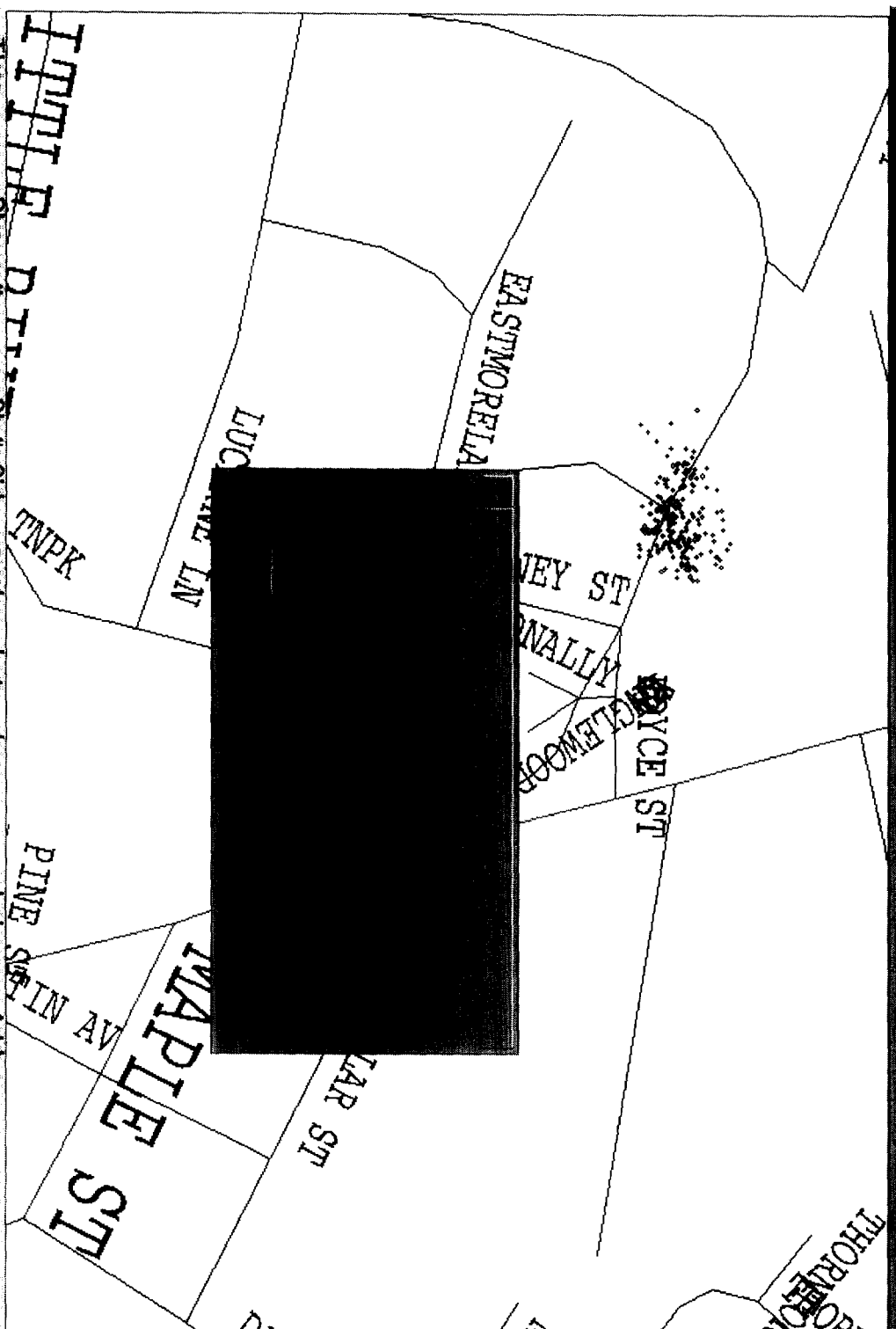
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17:37:17.79	***-***-***	571	2	1	38.83015	-77.19718	1	---
17:37:34.15	***-***-***	571	2	11			1	---
17:37:36.62	***-***-***	571	2	5			1	---
17:37:39.69	***-***-***	571	2	358			1	---

1/26/96
78 collections
radius: 1 meter

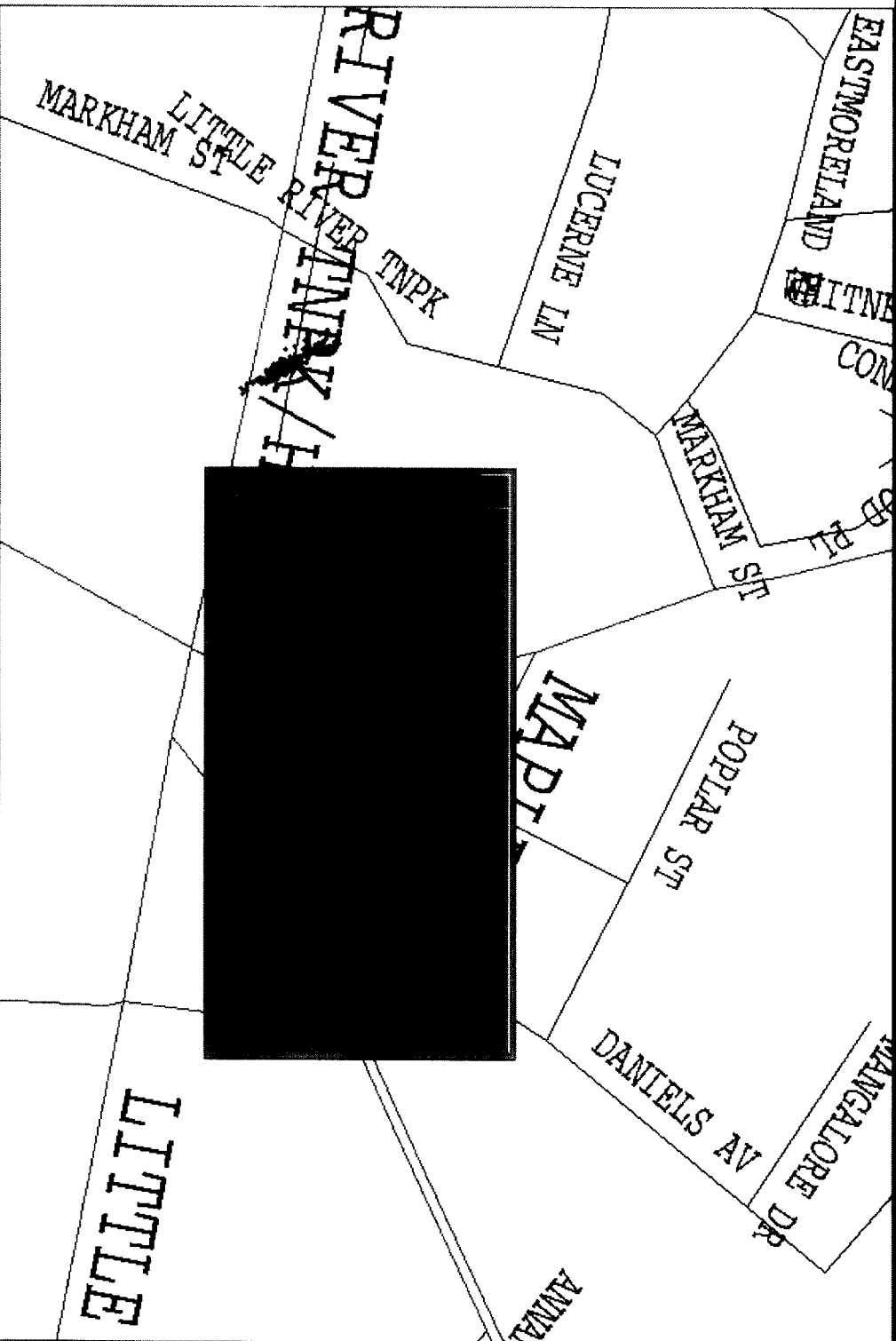


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16:32:12.71	***-***-****	609	1	2	36.83272	-77.20100	1	---
16:32:16.75	***-***-****	609	1	2	36.83268	-77.20097	1	---
16:32:20.85	***-***-****	609	1	2	36.83273	-77.20106	1	---
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1/20/96
203 collections
radius: 1 meter



Time	Phone #	Ch. #	Sid	angle	Lat.	Lon.	Index	Address
17:21:09.96	***-***-***	462	1	2	38.83499	-77.28004	1	---
17:21:14.00	***-***-***	462	1	2	38.83496	-77.28028	1	---
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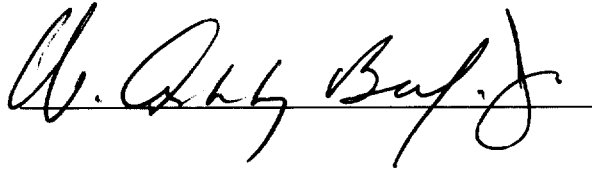


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16:58:47.21	***-***-***	651	1	2	38.83115	-77.19941	1	---

1/26/86
202 collections
radius: 1 meter

CERTIFICATE OF SERVICE

I, W. Ashby Beal, Jr., do hereby certify that a copy of the foregoing Additional Comments of KSI Inc. was served this 4th day of March, 1996, via U.S. Mail, first class postage prepaid, to the parties listed on the following pages.

A handwritten signature in cursive script, reading "W. Ashby Beal, Jr.", is written over a horizontal line.

James S. Blaszak
Ellen G. Block
Levine, Blaszak, Block & Boothby
1300 Connecticut Ave., NW,
Suite 500
Washington, DC 20036

Frank Michael Panek
Ameritech
Room 4H84
2000 West Ameritech Center Drive
Hoffman Estates IL 60196-1025

Robert M. Gurss
Wilkes, Artis, Hedrick & Lane
1666 K Street, NW
Suite 1100
Washington, DC 20006

Elizabeth R. Sachs
Lukas, McGowan, Nace & Gutierrez
1111 19th Street, NW
Suite 1200
Washington, DC 20036

William F. Adler
Steven N. Teplitz
Fleischman & Walsh
1400 Sixteenth Street, NW
Washington, DC 20036

William B. Barfield
Jim O. Llewellyn
BellSouth Corporation
1155 Peachtree Street, NE
Atlanta, GA 30309-3610

Glenn S. Rabin
ALLTEL Mobile Communications
655 15th Street, NW
Suite 220
Washington, DC 20005

Bruce D. Jacobs
Glenn S. Richards
Fisher Wayland Cooper, et. al.
2001 Pennsylvania Avenue, NW
Suite 400
Washington, DC 20006

Jim Conran
Ad Hoc Alliance for Public
Access to 911
P.O. Box 2346
Orinda, CA 94563

Lon C. Levin
AMSC Subsidiary Corp.
10802 Park Ridge Boulevard
Reston, VA 22091

James R. Hobson
Donelan, Cleary, Wood & Maser
1100 New York Avenue, NW
Suite 750
Washington, DC 20005

Gary O'Malley
Cable Plus
11400 SE 6th Street
Suite 120
Bellevue, WA 98004

James S. Blaszak
Ellen G. Block
Levine, Blaszak, Block & Boothby
1300 Connecticut Ave., NW,
Suite 500
Washington, DC 20036

Frank Michael Panek
Ameritech
Room 4H84
2000 West Ameritech Center Drive
Hoffman Estates IL 60196-1025

Robert M. Gurss
Wilkes, Artis, Hedrick & Lane
1666 K Street, NW
Suite 1100
Washington, DC 20006

Elizabeth R. Sachs
Lukas, McGowan, Nace & Gutierrez
1111 19th Street, NW
Suite 1200
Washington, DC 20036

William F. Adler
Steven N. Teplitz
Fleischman & Walsh
1400 Sixteenth Street, NW
Washington, DC 20036

William B. Barfield
Jim O. Llewellyn
BellSouth Corporation
1155 Peachtree Street, NE
Atlanta, GA 30309-3610

Glenn S. Rabin
ALLTEL Mobile Communications
655 15th Street, NW
Suite 220
Washington, DC 20005

Bruce D. Jacobs
Glenn S. Richards
Fisher Wayland Cooper, et. al.
2001 Pennsylvania Avenue, NW
Suite 400
Washington, DC 20006

Jim Conran
Ad Hoc Alliance for Public
Access to 911
P.O. Box 2346
Orinda, CA 94563

Lon C. Levin
AMSC Subsidiary Corp.
10802 Park Ridge Boulevard
Reston, VA 22091

James R. Hobson
Donelan, Cleary, Wood & Maser
1100 New York Avenue, NW
Suite 750
Washington, DC 20005

Gary O'Malley
Cable Plus
11400 SE 6th Street
Suite 120
Bellevue, WA 98004

Michael F. Altschul
CTIA
1250 Connecticut Avenue, NW
Suite 200
Washington, DC 20036

Thomas Gutierrez
Lukas, McGowan, Nace & Gutierrez
Suite 1200
1111 Nineteenth Street, NW
Washington, DC 20036

Alicia A. McGlinchey
COMSAT Mobile Communications
22300 COMSAT Drive
Clarksburg, MD 20871

Charles P. Featherstun
David G. Richards
BellSouth Corporation
1133 21st Street, NW
Suite 900
Washington, DC 20036

Peter Arth, Jr.
People of the State of California
and the Public Utilities Comm
505 Van Ness Avenue
San Francisco, CA 94102

Adam A. Andersen
CMT Partners
651 Gateway Boulevard
15th Floor
South San Francisco, CA 94080

J. D. Hersey, Jr.
Chief, Maritime Radio and
Spectrum Management
United States Coast Guard
2100 Second Street, SW
Washington, DC 20593-0001

Robert A. Mazer
Rosenman & Colin
Suite 200
1300 19th Street, NW
Washington, DC 20036

Paul R. Schwedler
Regulatory Counsel
Defense Information Sys Agency
Code DO1
701 S. Courthouse Road
Arlington, VA 22204

Danny E. Adams
Ann M. Plaza
Wiley, Rein & Fielding
1776 K Street, NW
Washington, DC 20006

Andre J. Lachance
David J. Gudino
GTE Service Corporation
1850 M Street, NW
Suite 1200
Washington, DC 20036

Robert S. Koppel
Richard S. Whitt
IDB Mobile Communications, Inc.
15245 Shady Grove Road
Suite 460
Rockville, MD 20850

S. A. Pennington
Chairman, Interagency Committee
on Search & Rescue
United States Coast Guard
2100 Second Street, NW
Washington, DC 20593-0001

Susan H. R. Jones
Gardner, Carton & Douglas
1301 K Street, NW
Suite 900, East Tower
Washington, DC 20005

Brian R. Moir
Moir & Hardman
2000 L Street, NW
Suite 512
Washington, DC 20036-4907

Larry A. Blosser
Donald J. Elardo
MCI Telecommunications Corp.
1801 Pennsylvania Avenue, NW
Washington, DC 20006

Robert S. Foosaner
Lawrence R. Krevor
Nextel Communications, Inc.
800 Connecticut Avenue, NW
Suite 1001
Washington, DC 20006

Thomas H. Bugbee
Regulatory Affairs
Telecommunications Branch
Information Technology Services
P. O. Box 2231
Downey, CA 90242

David C. Jatlow
Young & Jatlow
Suite 600
2300 N Street, NW
Washington, DC 20037

B. J. Smith
911 Emergency Telephone Ops
Hillsborough County, Office
of the County Administrator
P. O. Box 1110
Tampa, FL 33601

Paul C. Besozzi
D. Cary Mitchell
Besozzi, Gavin & Craven
1901 L Street, NW
Suite 200
Washington, DC 20036

Paul Rodgers
Charles D. Gray
NARUC
1102 ICC Building
P.O. Box 684
Washington, DC 20044

Lylle V. Gallagher
State 911 Coordinator
Emergency Services Communication
System Advisory Committee
P. O. Box 5511
Bismarck, ND 58502-5511

Michael D. Kennedy
Michael A. Menius
Motorola, Inc.
1350 I Street, NW
Suite 400
Washington, DC 20005

George N. Rover, Deputy A.G.
AOG/Legal Affairs
State of New Jersey
Hughes Justice Complex
CN 080
Trenton, NJ 08625-0080

Albert H. Kramer
Robert F. Aldrich
Keck, Mahin & Cate
1201 New York Avenue, NW
Penthouse Suite
Washington, DC 20005-3919

Stephen L. Goodman
Halprin, Temple & Goodman
1100 New York Avenue, NW
Suite 650 East
Washington, DC 20005

John G. Lamb
Northern Telecom, Inc.
2100 Lakeside Boulevard
Richardson, TX 75081-1599

Lisa M. Zaina
OPASTCO
21 Dupont Circle, NW
Suite 700
Washington, DC 20036

James P. Tuthill
Betsy Stover Granger
Pacific Bell
140 New Montgomery Street
Room 1525
San Francisco, CA 94105

Naomi L. Wu
Communications Manager
Port Angeles Police Dep't
321 East 5th Street
Port Angeles, WA 98362

Michael J. Celeski
Pertech America, Inc.
One Illinois Center
111 East Wacker Drive
Suite 500
Chicago, IL 60601

Edward R. Wholl
Jacqueline E. Holmes Nethersole
NYNEX Companies
120 Bloomingdale Road
White Plains, NY 10605

David C. Yandell
Technology & Ops Section
Emergency Management Division
Oregon State Police
595 Cottage Street, NE
Salem, OR 97310

James L. Wurtz
Pacific Bell
1275 Pennsylvania Avenue, NW
Washington, DC 20004

Mark J. Golden
Personal Communications Industry
Association
1019 19th Street, NW
Suite 1100
Washington, DC 20036

Mary A. Boyd
JEM Co-Chair
Texas Emergency Communications
Commission
1101 Capital of TX Hwy, South
Austin, TX 78749

Jerome S. Caplan
Redcom Laboratories, Inc.
One Redcom Center
Victor, NY 14564-0995

Jean L. Kiddoo
Shelly L. Spencer
Swidler & Berlin
3000 K Street, NW
Suite 300
Washington, DC 20007

O. C. Lee
Proctor & Associates
15050 Northeast 36th
Redmond, WA 98052-5317

Wayne Watts
Bruce E. Beard
Southwestern Bell Mobile Systems
17330 Preston Road
Suite 100A
Dallas, TX 75252

Raul R. Rodriguez
Stephen D. Baruch
Leventhal, Senter, & Lerman
2000 K Street, NW
Suite 600
Washington, DC 20006

Gary Jones
JEM Co-Chair
Omnipoint Corporation
1365 Garden of the Gods Road
Colorado Springs, CO 80907

James D. Ellis
Mary Marks
SBC Communications, Inc.
175 E. Houston, Suite 1306
San Antonio, TX 78205

Leonard Schuchman
Systems Integration Group
Stanford Telecom
1761 Business Center Drive
Reston, Va 22090

David L Jones
Rural Cellular Association
2120 L Street, NW
Suite 520
Washington, DC 20037

Peter J. Tyrrell
Springwich Cellular L. P.
227 Church Street
Room 1021
New Haven, CT 06510

Alfred Sonnenstrahl
Telecommunications for the Deaf
8719 Colesville Road
Suite 300
Silver Spring, MD 20910

Dan Bart
Eric Schimmel
Ron Angner
TIA
2500 Wilson Blvd., Suite 300
Arlington, VA 22201

Norman P. Leventhal
Stephen D. Baruch
David S. Keir
Leventhal, Senter & Lerman
2000 K Street, NW, Suite 600
Washington, DC 20006

R. Michael Senkowski
Jeffrey S Linder
Ilene T. Weinreich
Wiley, Rein & Fielding
1776 K Street, NW
Washington, DC 20006

Scott S. Sawyer
Assistant Attorney General
Consumer Protection Division
P. O. Box 12548
Capitol Station
Austin, TX 78711-2548

Arthur A. Butler
Ater Wynne Hewitt Dodson & Skerritt
601 Union Street
Suite 5450
Seattle, WA 98101-2327

James Carlsen
Westinghouse Electric Corp.
Electronic Systems Group
P. O. Box 746 - MS A475
Baltimore, MD 21203

David Kelley
Terrapin Corp.
11958 Monarch Street
Garden Grove, CA 92641

Jeffrey L Sheldon
Thomas E. Goode
UTC
1140 Connecticut Avenue, NW
Suite 1140
Washington, DC 20036

Michael J. Miller
Telident, Inc.
4510 West 77th Street
Suite 101
Minneapolis, MN 55435

Jeffrey S. Bork
U S West
1020 19th Street, NW
Suite 700
Washington, DC 20036

Robert G. Oenning
State of Washington
Statewide E911 Program
1417 6th Avenue SE
P. O. Box 48346
Olympia WA 98504-8346

William T. Bradfield
Tendler Cellular
65 Atlantic Avenue
Boston, MA 02110

Michael L. King
Anacortes Communications Center
Anacortes Police Department
1011 - 12th Street
Anacortes, WA 98221

Martin W. Bercovici
Keller & Heckman
1001 G Street, NW
Suite 500W
Washington, DC 20001-4545

Lorri Ann Ericson
Puyallup City Communications
1531 39th Avenue, SE
Puyallup, WA 98374

Betsy L. Anderson
1320 N. Courthouse Road
Eighth Floor
Arlington, Va 22201

David L. Nace
Marci E. Greenstein
Lukas, McGowan, Nace & Gutierrez
1111 19th St., NW, 12th Floor
Washington, DC 20036

Raymond G. Bender, Jr.
J. G. Harrington
Dow, Lohnes & Albertson
1255 23rd Street, NW, Suite 500
Washington, DC 20037

Martha Carter
911 Administrator
Caddo Parish Communications District
Number One
1144 Texas Avenue
Shreveport, LA 71101

Catherine A. Massey
William Covington
1150 Connecticut Avenue, NW
4th Floor
Washington, DC 20036

Roy D. Meridith
N. C. Chapter of NENA
P. O. Box 429
High Point, NC 27261-0429

James Dye
Chairman PCS Committee
GA NENA
140 N. Marietta Pkwy.
Marietta, GA 30060

R. Daniel Foley
Harris Corporation
Digital Telephone Systems Division
300 Bel Marin Keys Blvd.
Novato, CA 94948-1188

Clement Driscoll
C. J. Driscoll & Associates
2066 Dorado Drive
Rancho Palos Verdes, CA 90275

Pro-West & Associates
Philip G. Sailer
P. O. Box 812
Highway #371 N.
Walker, MN 56484

National Cellular Safe-Talk Center
John Cusack
385 Airport Road, Ste. A
Elgin, IL 60123

Dept. of Corrections
G. Kevin Carruth
Deputy Director
Planning & Construction Division
P. O. Box 942883
Sacramento, CA 94283-0001

ADCOMM Engineering Co.
Joe Blaschka
Technical Consultant
14631 128th Ave., NE
Woodlinville, WA 98072

American Mobile Telecommunications
Association, Inc.
Elizabeth R. Sachs, Esq.
1150 18th St., NW
Suite 250
Washington, DC 20036

Orbital Communications Corp.
Albert Halprin, Esq.
Halprin, Temple & Goodman
1100 New York Ave., NW
Ste. 650, East Tower
Washington, DC 20005

GEOTEK Communications, Inc.
Susan H. R. Jones
Gardner, Carton & Douglas
1301 K Street, NW
Ste. 900, East Tower
Washington, DC 20005

American Personal Communications
Jonathan D. Blake
Covington & Burling
1201 Pennsylvania Ave., NW
Washington, DC 20044

Deborah Poritz, Esq.
Attorney General
Dept. of Law & Public Safety
Hughes Justice Complex
CN 080
Trenton, NJ 08625-0080

Dr. James Costantino
ITS America
Suite 800
400 Virginia Ave., SW
Washington, DC 20024-2730